

Layer Transfer of Low Defect SiGe Using an Etch-back Process

ABSTRACT OF THE INVENTION

A method for forming strained Si or SiGe on relaxed SiGe on insulator (SGOI) or a SiGe
5 on Si heterostructure is described incorporating growing epitaxial $Si_{1-y}Ge_y$ layers on a
semiconductor substrate, smoothing surfaces by Chemo-Mechanical Polishing, bonding two
substrates together via thermal treatments and transferring the SiGe layer from one substrate to
the other via highly selective etching using SiGe itself as the etch-stop. The transferred SiGe layer
10 may have its upper surface smoothed by CMP for epitaxial deposition of relaxed $Si_{1-y}Ge_y$, and
strained $Si_{1-y}Ge_y$ depending upon composition, strained Si, strained SiC, strained Ge, strained
GeC, and strained $Si_{1-y}Ge_yC$ or a heavily doped layer to make electrical contacts for the SiGe/Si
heterojunction diodes.